

REMARKS

Claims 1-29 and 35-40 stand rejected and claims 30-34 are allowed. The Applicants have currently amended claims 1-3, 7, 12, 15, 22-24, 28, 29, 35, and 38 for clarification and to address the Examiners objections. The Applicants have currently added new claims 41-44. Support for the amendments can be found at paragraphs [0044], [0045], [0055] to [0059], [0065], [0134], and [0135] of the Applicants' published application, for example.

Accordingly, claims 1-45 are now pending in the application. Claims 1, 22, 35, and 38 are independent.

Specification

The Examiner objects to the drawings under 37 CFR 1.84(p)(5) as Figure 2 includes reference character 235 not explicitly mentioned in the specification. In response, Applicants have amended the specification, as reflected above, so that paragraph [0090] of the specification now explicitly mentions step 235 of Figure 2. Support for the amendments can be found at paragraph [0090] and Figure 2 of the Applicants' published application, for example.

The Examiner objects to the abstract of the disclosure as it exceeds 150 words in length. In response, Applicants have amended the abstract, as reflected above, so that it no longer exceeds 150 words. Support for the amendments can be found in the original abstract and at paragraphs [0045], [0055] to [0059], [0117] and [0129] Applicants' published application, for example.

Withdrawal of the objections is respectfully requested.

Claim Objections

The Examiner objects to claim 38 as including minor informalities and asserts that the phrase "if intensities if" requires correction. To obviate the objection, the Applicants have amended claim 38 according to the Examiner's suggestion, as reflected in the foregoing listing of claims. For consistency, claim 22 has been similarly amended. Withdrawal of the objection is respectfully requested.

Claims Rejections under 35 U.S.C. §112

The Examiner has rejected claims 1-29, 35-37, 39, and 40 under 35 U.S.C. §112 second paragraph as being indefinite.

Regarding claims 1, 12, 14, 15, 22 and 35, the Examiner has objected to the term "if" and suggests replacing "if" with "when" to clarify that the limitations following the term are part of the claimed invention. To address the objection, the Applicants' have amended claims 1, 12, 14, 15, 22 and 35 according to the Examiner's suggestion.

Regarding claims 2, 3, 23, and 24, the Examiner has objected to the limitation "the beamlet" alleging that the antecedent basis is unclear. In response, the Applicants have amended claims 2, 3, 23, and 24 to clarify the form of the claimed beamlet sums and in turn the term "the beamlet", as reflecting in the foregoing listing of claims. Support for the amendments can be found in the application as published at e.g. paragraphs [0044] and [0045].

Regarding claims 28 and 29, the Examiner has objected to the limitation "the dose delivery" alleging that the antecedent basis is unclear. In response, the Applicants have added new claim 41 that recites the step of delivering radiation.

Claims 28 and 29 as currently amended depend upon claim 41 to provide proper antecedent basis for the limitation.

Withdrawal of the rejections under 35 U.S.C. §112 second paragraph is respectfully requested.

Claims Rejections under 35 U.S.C. §101

On page 4 of the office action, the Examiner has rejected claims 22-29 and 38 under 35 U.S.C. §101, alleging that the claims are directed to non-statutory subject matter. Specifically, the Examiner asserts that the subject matter of the claims is directed to a judicial exception and, as such, must have a useful, concrete, and tangible result. The Examiner properly concedes that the claims are directed to subject matter that is useful and concrete. However, the Examiner asserts that there does not appear to be a tangible result claimed since *"the outcome of the determining step has not been used in a disclosed practical application nor made available in such a manner that its usefulness in a disclosed practical application can be realized"*.

Applicants' respectfully submit that amended claims 22 and 38 are directed to subject matter that produces a final result that is tangible. Specifically, Applicants have amended claim 22 to clarify that the claimed method is computer-implemented. Applicants have amended claims 22 and 38 to include the step of making the determined optimal set of weights available for use in delivering radiation. Support for the amendments can be found at e.g. paragraphs [0065], [0129], [0134] to [0136], and Figures 1 and 8 of the Applicants' application as published.

Accordingly, amended claim 22 is directed to a computer-implemented method that, as a final result, makes a determined optimal set of weights of

beamlets available for use in delivering radiation. Amended claim 38 is directed to computer readable storage having stored thereon computer program instructions executable on a computer system for causing the computer system to make a determined optimal set of weights of beamlets available for use in delivering radiation as a final result. Making the determined optimal set of weights available for use in delivering radiation allows its usefulness to be realized in the disclosed practical application of delivering radiation. Examples of "making available" may include: generating an output file 130 (see e.g. Figure 1 of the Applicants' application as published) for provision to a radiation dose delivery apparatus (see e.g. paragraph [0065] of the Applicants' application as published); storing in a computer system 10 memory 20 (see e.g. Figure 8 and paragraph [0134] of the Applicants' application as published); and/or providing to a computer system 10 for use in generating output data 130 (see e.g. Figure 8 and paragraph [0135] of the Applicants' application as published).

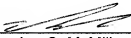
MPEP 2106 provides that "[t]he tangible requirement does not necessarily mean that a claim must either be tied to a particular machine or apparatus or must operate to change articles or materials to a different state or thing. However, the tangible requirement does require that the claim must recite more than a 35 U.S.C. 101 judicial exception, in that the process claim must set forth a practical application of that judicial exception to produce a real-world result. Benson, 409 U.S. at 71-72, 175 USPQ at 676-77 "[A]n application of a law of nature or mathematical formula to a ... process may well be deserving of patent protection." Diehr, 450 U.S. at 187, 209 USPQ at 8 (emphasis added); see also Corning, 56 U.S. (15 How.) at 268, 14 L.Ed. 683 ("It is for the discovery or invention of some practical method or means of producing a beneficial result or effect, that a patent is granted . . .").

The claimed computer-implemented embodiments produce a real-world and beneficial result of making the determined optimal set of weights available for use in the practical application of delivering radiation. Accordingly, for at least the above reasons, Applicants submit that the subject matter of claims 22 and 38 are directed to patent eligible subject matter. Withdrawal of the rejections under 35 U.S.C. §101 is respectfully requested.

Conclusion

In view of the foregoing, it is submitted that each of claims 1-45 is in form for allowance, and a notice to that effect is respectfully requested. Should there be any remaining issues after this amendment, the Examiner is kindly invited to call the undersigned and arrange for a telephone interview with the Applicants' representative to expedite prosecution of the application.

Respectfully submitted,
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